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FORM PTO-1390 (REV 10-94)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		DOCKET #: 3397-107PUS
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				
				U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/937160
INTERNATIONAL APPLICATION NO. PCT/FI00/00241		INTERNATIONAL FILING DATE 23 March 2000		PRIORITY DATE CLAIMED 26 March 1999
TITLE OF INVENTION Coated Holder and Rod in a Rod-Type Web Coating Apparatus				
APPLICANT(S) FOR DO/EO/US Petri PARNI; Atte TAKKINEN				
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:				
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371 3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). 4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> has been transmitted by the International Bureau. c. <input checked="" type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) 6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). Unexecuted 10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). 				
Items 11. to 16. Below concern other document(s) or information included:				
11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.				
12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.				
13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.				
14. <input type="checkbox"/> A substitute specification.				
15. <input type="checkbox"/> A change of power of attorney and/or address letter.				
16. <input checked="" type="checkbox"/> Other items or information (<i>specify</i>): PCT Publication Sheet, Int'l Preliminary Examination Report, PCT Request, PCT Demand; and Communication Stating Change in Name of Applicant.				

U.S. APPLICATION NO (If known, use 37 CFR 1.53) <div style="font-size: 1.5em; font-weight: bold;">09/937160</div>		INTERNATIONAL APPLICATION NO <div style="font-weight: bold;">PCT/FI00/00241</div>		ATTORNEY'S DOCKET NUMBER <div style="font-weight: bold;">3397-107PUS</div>	
17.[x]The following fees are submitted:					
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO\$860.00 International preliminary examination fee paid to USPTO (37 CFR 1.482).....\$690.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).....\$710.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO\$1000.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)\$100.00					
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$	860
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
Claims	Number Filed	Number Extra	Rate		
Total Claims	44 - 20 =	24	x \$18.00	\$	432
Independent Claims	1 - 3 =	0	x \$80.00	\$	0
Multiple dependent claim(s) (if applicable)			+ \$270.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$	1292
Reduction of 1/2 for filing by small entity, if applicable.				\$	
SUBTOTAL =				\$	1292
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$	1292
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by the appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED					\$1292
				Amount to be refunded:	\$
				charged:	\$
a. [x] One check in the amount of \$ <u>1291</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. <u>03-2412</u> in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. [x] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>03-2412</u> . A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO: <u>Michael C. Stuart</u> Cohen, Pontani, Lieberman & Pavane 551 Fifth Avenue, Suite 1210 New York, New York 10176			<div style="font-size: 1.2em; font-family: cursive;">Michael C. Stuart</div> <u>Michael C. Stuart</u> <u>Registration Number: 35,698</u> <u>Tel: (212) 687-2770</u>		

09/937160

By Express Mail
No EL895344592US

J003 Received TO 20 SEP 2001

Attorney Docket # 3397-107PUS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Phase PCT Application of

Petri PARNI et al.

International Appln. No.: PCT/FI00/00241

International Filing Date: March 23, 2000

For: Coated Holder and Rod in a Rod-Type Web
Coating Apparatus

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

BOX PCT

S I R:

Prior to examination of the above-identified application, amend the application as follows:

IN THE SPECIFICATION:

Page 1, before line 4, insert the following title:

--FIELD OF THE INVENTION--

Page 1, the paragraph from line 4 to 5 is to read as follows:

--The present invention relates to a rod doctor for metering the amount of coating mix applied to the surface of a moving web of board or paper or to the applicator roll surface in a film-transfer coater and for leveling the applied coat.--

Page 1, after the above paragraph and before line 7, insert the following title:

--BACKGROUND OF THE INVENTION--

Page 2, before line 26, insert the following title:

--SUMMARY OF THE INVENTION--.

Page 3, delete the paragraph from line 12 to line 14.

Page 4, delete the paragraph from line 5 to line 7 and insert the following paragraph, title and paragraph:

--Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are intended solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, wherein like reference numerals delineate similar elements throughout the several views:--.

Page 4, before line 17, insert the following title:

--DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS--.

Page 4, after line 16 (last line), insert the following paragraph:

--Thus, while there have been shown and described and pointed out fundamental novel features of the present invention as applied to preferred embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices described and illustrated, and in their operation may be made by those skilled in the art without departing from the spirit of the present invention. For example, it is expressly intended that all combinations of those elements which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Substitutions of elements from one described embodiment to another are also fully intended and contemplated. It is also to be understood that the drawings are not necessarily drawn to scale but that they are

merely conceptual in nature. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.--.

Replace the paragraph from page 5, line 29, to page 6, line 9, with the following paragraph:

--A surfacing layer fabricated by vacuum deposition techniques is comparatively thin; its thickness typically varies from 1 nm to 90 μ m. In spite of its infinitesimal thickness, the surfacing layer is entirely free from pores and conforms without cracks to the contour of the object being coated as the layer is produced at an atomic layer deposition level. The substrate to be surfaced by vacuum deposition can be of almost any material such as a metal, stone, plastic or glass. The surfacing materials used herein are selected from the groups of metals, metal alloys, oxides, nitrides or carbides. Different kinds of surface coatings may vary vastly in terms of their properties.--.

Page 8, line 1, delete the paragraph "Claims:" and insert the following paragraph:

--What is claimed is:--.

IN THE CLAIMS:

Cancel claims 1 to 9, without prejudice.

Add the following new claims:

10. A rod doctor suitable for metering an amount of a coating mix applied to a surface of a moving web of board or paper, or to an applicator roll surface of a film-transfer coater, and for leveling the applied coat, comprising:

a support frame having a cradle formed therein;

a rod positioned in the cradle of said support so as to be capable of rotating therein, a surface of the cradle on which said rod rotates being covered by a surface layer of a material which improves wear resistance and sliding friction properties of the cradle and said rod.

11. The rod doctor of claim 10, wherein a surface of the rod is covered by a surface layer of a material which improves wear resistance and sliding friction properties of said rod.

12. The rod doctor of claim 10, wherein the surface layer has a thickness of from 1 nm to 90 μ m.

13. The rod doctor of claim 11, wherein the surface layers have a thickness of from 1 nm to 90 μ m.

14. The rod doctor of claim 10, wherein the surface layer is comprised of a silicon-molybdenum alloy.

15. The rod doctor of claim 11, wherein the surface layers are comprised of a silicon-molybdenum alloy.

16. The rod doctor of claim 12, wherein the surface layer is comprised of a silicon-molybdenum alloy.

17. The rod doctor of claim 13, wherein the surface layers are comprised of a silicon-molybdenum alloy.

18. The rod doctor of claim 10, wherein the surface layer is comprised of diamond.

19. The rod doctor of claim 11, wherein the surface layers are comprised of diamond.

20. The rod doctor of claim 12, wherein the surface layer is comprised of diamond.

21. The rod doctor of claim 13, wherein the surface layers are comprised of diamond.

22. The rod doctor of claim 10, wherein the surface layer is comprised of chromium.
23. The rod doctor of claim 11, wherein the surface layers are comprised of chromium.
24. The rod doctor of claim 12, wherein the surface layer is comprised of chromium.
25. The rod doctor of claim 13, wherein the surface layers are comprised of chromium.
26. The rod doctor of claim 10, wherein the surface layer is comprised of a chromium-teflon composition.
27. The rod doctor of claim 11, wherein the surface layers are comprised of a chromium-teflon composition.
28. The rod doctor of claim 12, wherein the surface layer is comprised of a chromium-teflon composition.
29. The rod doctor of claim 13, wherein the surface layers are comprised of a chromium-teflon composition.
30. The rod doctor of claim 10, wherein the surface layer is applied using a vacuum deposition technique.
31. The rod doctor of claim 11, wherein the surface layers are applied using a vacuum deposition technique.

32. The rod doctor of claim 12, wherein the surface layer is applied using a vacuum deposition technique.

33. The rod doctor of claim 13, wherein the surface layers are applied using a vacuum deposition technique.

34. The rod doctor of claim 14, wherein the surface layer is applied using a vacuum deposition technique.

35. The rod doctor of claim 15, wherein the surface layers are applied using a vacuum deposition technique.

36. The rod doctor of claim 18, wherein the surface layer is applied using a vacuum deposition technique.

37. The rod doctor of claim 19, wherein the surface layers are applied using a vacuum deposition technique.

38. The rod doctor of claim 22, wherein the surface layer is applied using a vacuum deposition technique.

39. The rod doctor of claim 23, wherein the surface layers are applied using a vacuum deposition technique.

40. The rod doctor of claim 26, wherein the surface layer is applied using a vacuum deposition technique.

41. The rod doctor of claim 27, wherein the surface layers are applied using a vacuum deposition technique.

42. The rod doctor of claim 10, wherein the surface layer is applied using a thermal spraying technique.

43. The rod doctor of claim 11, wherein the surface layers are applied using a thermal spraying technique.

44. The rod doctor of claim 12, wherein the surface layer is applied using a thermal spraying technique.

45. The rod doctor of claim 13, wherein the surface layers are applied using a thermal spraying technique.

46. The rod doctor of claim 14, wherein the surface layer is applied using a thermal spraying technique.

47. The rod doctor of claim 15, wherein the surface layers are applied using a thermal spraying technique.

48. The rod doctor of claim 18, wherein the surface layer is applied using a thermal spraying technique.

49. The rod doctor of claim 19, wherein the surface layers are applied using a thermal spraying technique.

50. The rod doctor of claim 22, wherein the surface layer is applied using a thermal spraying technique.

51. The rod doctor of claim 23, wherein the surface layers are applied using a thermal spraying technique.

52. The rod doctor of claim 26, wherein the surface layer is applied using a thermal spraying technique.

53. The rod doctor of claim 27, wherein the surface layers are applied using a thermal spraying technique.

54. The rod doctor of claim 28, wherein the surface layers are applied using a thermal spraying technique.

REMARKS

This preliminary amendment is presented to place the application in proper form for examination and to eliminate multiple dependency from the present claims. No new matter has been added.

The paragraph from page 5, line 29, to page 6, line 9, has been amended to correct an obvious typographical error which appears in the specification, but which was corrected in claim 3 of the PCT application as published, namely that the thickness of the coating(s) can be as thick as 90 μ m, rather than 90 m.

Early examination and favorable consideration of the above-identified application is earnestly solicited.

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
COHEN, PONTANI, LIEBERMAN & PAVANE

By: _____



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20 September 2001

AMENDMENTS TO THE APPLICATION

Page 1, the paragraph from line 4 to 5 has been amended as follows:

--The present invention relates to a rod doctor [according to the preamble of claim 1] for metering the amount of coating mix applied to the surface of a moving web of board or paper or to the applicator roll surface in a film transfer coater and for leveling the applied coat.--

The paragraph from page 5, line 29, to page 6, line 9, has been amended as follows:

--A surfacing layer fabricated by vacuum deposition techniques is comparatively thin; its thickness typically varies from 1 nm to 90 μ m. In spite of its infinitesimal thickness, the surfacing layer is entirely free from pores and conforms without cracks to the contour of the object being coated as the layer is produced at an atomic layer deposition level. The substrate to be surfaced by vacuum deposition can be of almost any material such as a metal, stone, plastic or glass. The surfacing materials used herein are selected from the groups of metals, metal alloys, oxides, nitrides or carbides. Different kinds of surface coatings may vary vastly in terms of their properties.--

Coated holder and rod in a rod-type web coating apparatus

The present invention relates to a rod doctor according
5 to the preamble of claim 1.

In coating a web of paper or board, the coating mix is first applied to the surface of a moving web, whereupon the excess coating is removed from the surface of the web and the coating layer is smoothed. Finally, the excess moisture content of the coating is removed in dryers. In blade application, a doctor blade is used for metering the applied amount of coat and smoothing the surface of the applied coating. Also a rod doctor, an air doctor or different kinds of rolls or scrapers can be used in the metering of the coating mix.

In most cases, the doctor blade of a blade coater can be replaced by a doctor rod. The rod doctor comprises a framework, which extends over the cross-machine width of the paper/boardmaking machine and has connected thereto a flexible loading hose, and a cradle into which the doctor rod is rotatably mounted. The rod is rotated in the cradle by means of a drive mechanism generally in a reverse direction to the travel direction of the moving web. Typically, the cradle is fabricated from a polymeric material, but may also be made from metal materials, for instance. Also the doctor rod may be made from a polymeric or metal material.

30

A problem generally occurring in conventional rod doctor constructions is vibration of the rod that makes the

applied coat layer uneven after leveling. Such vibration also causes clearly detectable pulsation in the running of the rod drive motors. A plausible cause of the vibration is the high friction between the cradle and the rod rotating therein. The amplitude of the vibration has also been found to increase as the paper/boardmaking machines become wider. To reduce the friction, the gap between the cradle and the rod can be filled with water that acts as a lubricant. However, the lubricating water may leak from the cradle into the coating mix thus diluting the coating and deteriorating the quality of the applied coat.

Another problem typically handicapping rod doctor assemblies is a rapid wear of the rod and its support cradle that also causes unevenness on the applied coat. Cradles made from urethane polymers have been found particularly prone to a fast wear. Attempts have been made to slow down the wear rate by means different ways, e.g., by coating the rod with a chromium, a glass/carbon-fiber or ceramic surface coatings, but these measures only serve to improve the wear resistance of the rod without exhibiting any essential reduction of the friction between the rod and the cradle.

It is an object of the present invention to overcome the drawbacks of the above-described prior art techniques and to provide an entirely novel type of rod doctor.

The goal of the invention is achieved by way of surfacing at least the cradle of the rod doctor by a thin surface coating layer. When necessary, a surface coating may also

be made on the rod that supposedly rotates in the cradle. The surface coating used herein is selected from a group of hard materials having good sliding and self-lubricating properties, whereby the coefficient of friction between the cradle and the rod rotating therein is reduced. By the same token, the vibration of the doctor is reduced and the wear of the rotating rod and its cradle is lessened. The coating layer may be fabricated using, e.g., so-called vacuum deposition techniques, one of which is physical vapor deposition.

More specifically, the leveling rod according to the invention is characterized by what is stated in the characterizing part of claim 1.

The invention offers significant benefits.

By virtue of the approach according to the invention, the sliding conditions between the rod and the cradle are improved, whereby the rod vibration and the problems associated therewith are reduced or even eliminated entirely. Due to the improved sliding properties, the drive mechanisms of a lower power rating than those of the prior art may be used for rotating the rod. The wear rate of the rod and its cradle is reduced resulting in less frequent need for leveling rod unit maintenance and giving a longer life. The rod can be rotated in its cradle without necessarily needing any lubricating water, whereby the web coating problems caused by water leakage are eliminated. Simultaneously, also the construction of the leveling rod unit is simplified, because no connections or other specific means for the lubrication water

circulation are required. The surface coating also serves to improve the corrosion resistance of the cradle and the rod.

5 In the following, the invention will be examined in greater detail by making reference to the appended drawings in which

Figure 1 shows a first embodiment of a rod doctor
10 according to the invention having its cradle surfaced; and

Figure 2 shows another embodiment of a rod doctor according to the invention having both the cradle and the
15 rod surfaced.

The leveling rod unit shown in figure 1 comprises support frame elements 2, 8 extending over the entire width of the paper/boardmaking machine and having a flexible loading hose 4 mounted therebetween. Into the support
20 frame element 2 is adapted a cradle 3 having a rod 1 adapted to supportedly rotate therein. The rod 1 is rotated by means of a drive mechanism, typically reverse to the travel direction of a web 5 being coated. The rod
25 1 is pressed by means of the loading hose 4 against the web 5 being coated, whereby the excess coating mix applied to the surface of the web 5 is removed and the applied coating layer is smoothed.

30 The cradle 3 is covered by a surfacing layer 6 with a thickness typically varying from a few nanometers to a few tens of micrometers. Advantageously, the layer 6 is

selected from the group of hard materials exhibiting good sliding and self-lubricating properties.

As shown in figure 2, both the leveling rod cradle 3 and the rod 1 rotatingly mounted therein are provided with a surfacing layer 6, 7. The surfacing layer 7 serves to improve the wear resistance of the rod 1 and to reduce the coefficient of friction between the cradle 3 and the rod 1. The surfacing layer 7 of the rod 1 may be of the same material as that of the surfacing layer 6 of the cradle 3. Normally, the surfacing layers 6, 7 are made from different materials, whereby the seizing tendency and wear rate of the sliding surfaces are generally reduced.

The surfacing layers 6, 7 may be formed by means of, e.g., vacuum deposition techniques. One such vacuum deposition method is the so-called physical vapor deposition (PVD), wherein the deposition process is carried out under a vacuum or in a low-pressure chamber into which the gas-phase coating material is introduced.

Conventionally, the coating material is vaporized by means of an electron beam or resistive heating.

Transported in the gas phase, the coating material adheres to the surface of the object being surfaced. When required, the coating process can be performed at an elevated temperature of about 400-500 °C.

A surfacing layer fabricated by vacuum deposition techniques is comparatively thin; its thickness typically varies from 1 nm to 90 m. In spite of its infinitesimal thickness, the surfacing layer is entirely free from

pores and conforms without cracks to the contour of the object being coated as the layer is produced at an atomic layer deposition level. The substrate to be surfaced by vacuum deposition can be of almost any material such as a metal, stone, plastic or glass. The surfacing materials used herein are selected from the groups of metals, metal alloys, oxides, nitrides or carbides. Different kinds of surface coatings may vary vastly in terms of their properties.

The surfacing layers 6, 7 of the cradle 3 and the rod 1 may be, e.g., a silicon molybdenum alloy in which silicon makes the surfacing layer 6, 7 hard, while molybdenum gives the favorable self-lubricating and sliding properties. Another advantageous alternative as a surface coating is a vacuum-deposited layer of diamond (DLC, Diamond Layer Coating) having a hardness typically in the range of 6,000 - 10,000 HV. This coating is highly resistant to acids and bases. Furthermore, a diamond coating gives a very low coefficient of friction against most other materials. For instance, the coefficient of friction between steel and a diamond coating is typically 0.1 in a sliding contact of dry surfaces that is only one-fifth of the coefficient of friction between two sliding steel surfaces under similar conditions. Other advantageous surfacing layer materials in an embodiment according to the invention are chromium and chromium-teflon composition.

In addition to those described above, the invention may have alternative embodiments.

The technique used for applying the surface coating may be selected rather freely. Instead of using vacuum deposition, the coating process may be performed using, e.g., thermal spraying in which the coating material is molten
5 into a hot plasma that is directed to impinge on the surface of the object to be coated. In thermal spraying, the coating materials are generally metals and plastics such as chromium, molybdenum or teflon. As the number of suitable materials for the surfacing layers 6, 7 of the
10 cradle 3 and the rod 1 is vast, the coating material must be selected according to the requirements set by the intended application and other similar factors. The rod doctor according to the invention may be used for metering the amount of coating mix applied to the applicator roll surface in a film-transfer coater and for
15 leveling the applied coat.

Claims:

1. Rod doctor intended for metering the amount of coating mix applied to the surface of a moving web (5) of board or paper or to the applicator roll surface in a film-transfer coater and for leveling the applied coat, the rod doctor comprising

- a support frame element (2),
- a cradle (3) adapted into the support frame element (2), and
- a rod (1) adapted to rotate in the cradle (3),

characterized in that the surfaces of the cradle (3) on which the rod (1) is adapted to conformingly rotate are covered by a surfacing layer (6) serving to improve the wear resistance and sliding friction properties of said surfaces.

2. Rod doctor according to claim 1, characterized in that the rod (1) is covered by a surfacing layer (7) serving to improve the wear resistance and sliding friction properties of the rod.

3. Rod doctor according to claim 1 or 2, characterized in that the thickness of the surfacing layer (6, 7) is from 1 nm to 90 μ m.

4. Rod doctor according to any one of claims 1 - 3, characterized in that the surfacing layer

(6, 7) is of a silicon-molybdenum alloy.

5 5. Rod doctor according to any one of claims 1 - 3,
c h a r a c t e r i z e d in that the material of the
surfacing layer (6, 7) is of diamond.

10 6. Rod doctor according to any one of claims 1 - 3,
c h a r a c t e r i z e d in that the surfacing layer
(6, 7) is of chromium.

10 7. Rod doctor according to any one of claims 1 - 3,
c h a r a c t e r i z e d in that the surfacing layer
(6, 7) is of a chromium-teflon composition.

15 8. Rod doctor according to any one of foregoing claims,
c h a r a c t e r i z e d in that the surfacing layer
(6, 7) is made using a vacuum deposition technique.

20 9. Rod doctor according to any one of claims 1 - 4,
c h a r a c t e r i z e d in that the surfacing layer
(6, 7) is made using a thermal spraying technique.

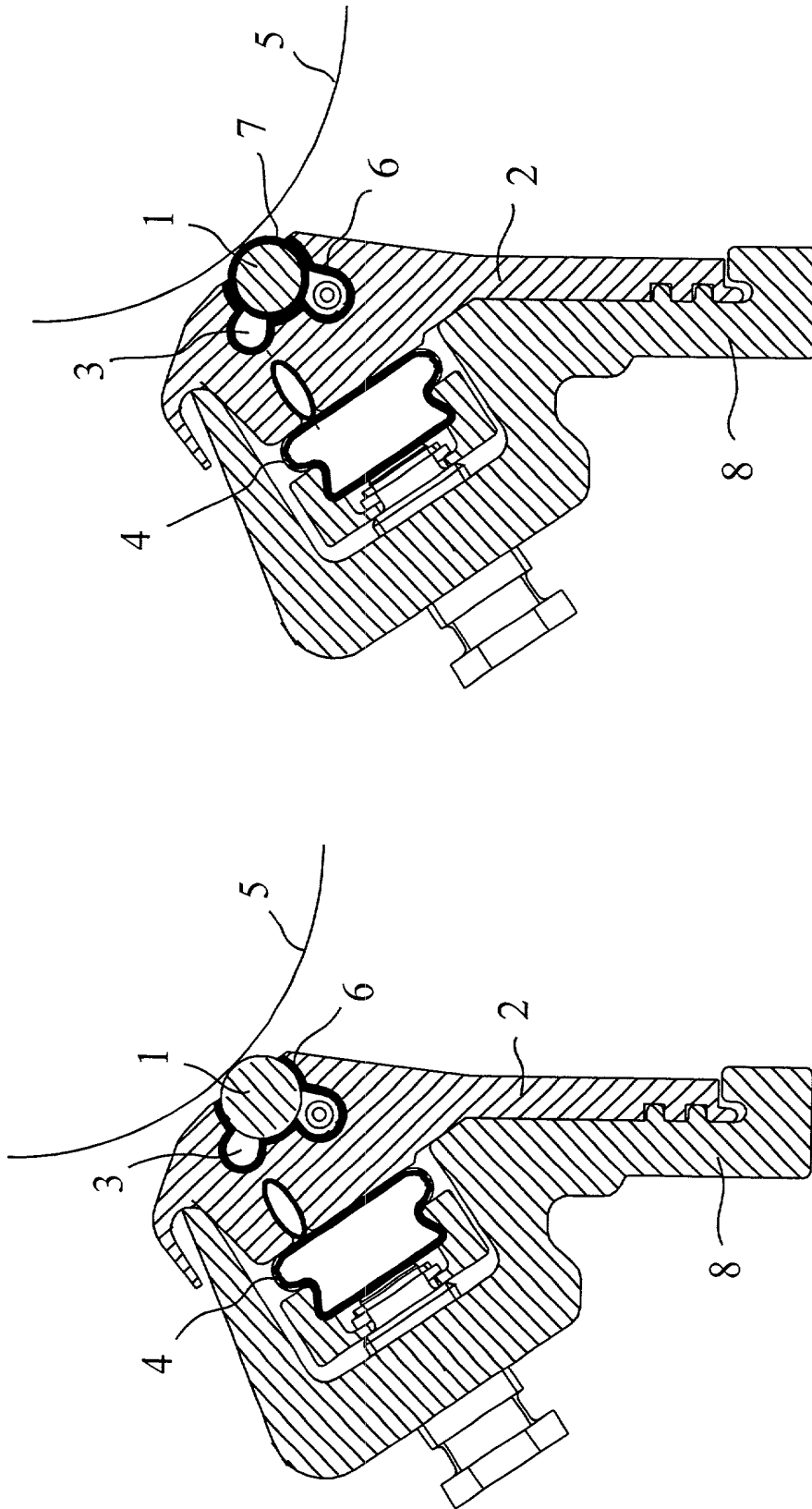


Fig. 2

Fig. 1

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY

Includes Reference to PCT International Applications

Attorney's Docket No.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: Coated holder and rod in a rod-type web coating apparatus

the specification of which (check only one item below)

☐ is attached hereto

☐ was filed as United States application

Serial No. _____

on _____

and was amended

on _____ (if applicable).

☒ was filed as PCT international application

Number PCT/FI00/00241

on March 23, 2000

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

PRIOR FOREIGN/PCT APPLICATIONS AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

Country (if PCT, indicate "PCT")	Application Number	Date of Filing (day, month, year)	Priority Claimed Under 35 U.S.C. 119	
Finland	990684	26 March 1999	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
PCT	PCT/FI00/00241	23 March 2000	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO

**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Continued)**

Attorney's Docket No.

Includes Reference to PCT International Applications

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:**U.S. APPLICATIONS****STATUS (check one)**

U.S. APPLICATION NUMBER

U.S. FILING DATE

PATENTED

PENDING

ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.PCT APPLICATION
NO.

PCT FILING DATE

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (*List name and registration number*)

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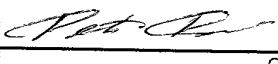

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Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)				Attorney's Docket No.
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
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205	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
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206	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
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208	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
209	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)				Attorney's Docket No.
2 1 0	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
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	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
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	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.</p>				
SIGNATURE OF INVENTOR 201		SIGNATURE OF INVENTOR 202		SIGNATURE OF INVENTOR 203
 DATE <u>01.10.2001</u> October 1, 2001		 DATE <u>10.10.2001</u> October 10, 2001		DATE
SIGNATURE OF INVENTOR 204		SIGNATURE OF INVENTOR 205		SIGNATURE OF INVENTOR 206
DATE		DATE		DATE
SIGNATURE OF INVENTOR 207		SIGNATURE OF INVENTOR 208		SIGNATURE OF INVENTOR 209
DATE		DATE		DATE
SIGNATURE OF INVENTOR 210		SIGNATURE OF INVENTOR 211		SIGNATURE OF INVENTOR 212
DATE		DATE		DATE